

Claims:

1. A material identification method comprising:
obtaining a multi-order spectrum from a sample;
comparing the multi-order spectrum to multi-order spectra for known compositions; and
outputting an identification of the sample based on a correlation between the multi-order spectrum from the sample and the multi-order spectra for the known compositions.
2. The method of claim 1, further comprising outputting one or more next closest identifications based upon the correlation between the multi-order spectrum from the sample and the multi-order spectra for known compositions.
3. The method of claim 1, wherein the correlation is a linear and a rank correlation.
4. The method of claim 1, wherein the correlation is a statistical correlation.
5. The method of claim 1, further comprising building a library of spectra for the known compositions.
6. The method of claim 1, wherein the comparison can be performed against a spectral library or a portion of a spectral library.
7. The method of claim 1, wherein the multi-order spectrum comprises at least a first and a second order spectra.
8. The method of claim 1, wherein the multi-order spectrum comprises all spectra.

9. The method of claim 1, further comprising outputting a correlation coefficient.
10. The method of claim 1, further comprising displaying a summary of the correlation.
11. A material identification system comprising:
 - a spectrometer adapted to obtain a multi-order spectrum from a sample;
 - a correlation module adapted to compare the multi-order spectrum to multi-order spectra for known compositions; and
 - an output device adapted to output an identification of the sample based on a correlation between the multi-order spectrum from the sample and the multi-order spectra for the known compositions.
12. The system of claim 11, wherein the output device outputs one or more next closest identifications based upon the correlation between the multi-order spectrum from the sample and the multi-order spectra for known compositions.
13. The system of claim 11, wherein the correlation is a linear and a rank correlation.
14. The system of claim 11, wherein the correlation is a statistical correlation.
15. The system of claim 11, wherein the output device as adapted to build a library of spectra for the known compositions.
16. The system of claim 11, wherein the comparison can be performed against a spectral library or a portion of a spectral library.

17. The system of claim 11, wherein the multi-order spectrum comprises at least a first and a second order spectra.

18. The system of claim 11, wherein the multi-order spectrum comprises all spectra.

19. The system of claim 11, wherein the output module determines and outputs a correlation coefficient.

20. The system of claim 11, wherein the output module cooperates with the correlation module to display a summary of the correlation.

21. A material identification system comprising:
means for obtaining a multi-order spectrum from a sample;
means for comparing the multi-order spectrum to multi-order spectra for known compositions; and
means for outputting an identification of the sample based on a correlation between the multi-order spectrum from the sample and the multi-order spectra for the known compositions.